National Aeronautics and Space Administration

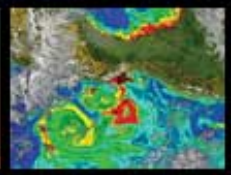
Marshall Space Flight Center

Launching the Future of Science and Exploration

marshall







Presenter's Name
Title
Date

www.nasa.gov

An Exciting Time To Be at NASA

Retire the SHUTTLE in 2010

Complete the INTERNATIONAL SPACE STATION

Establish a PERMANENT presence on the MOON

Bring the new EXPLORATION VEHICLES into service

Develop a BALANCED PROGRAM of science, exploration and aeronautics

Pursue PARTNERSHIPS with commercial space sector

Why Explore

To uphold America's leadership through:

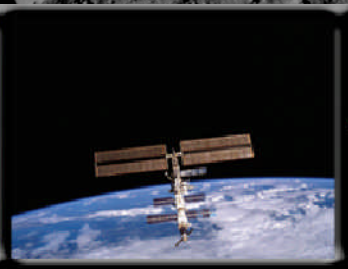
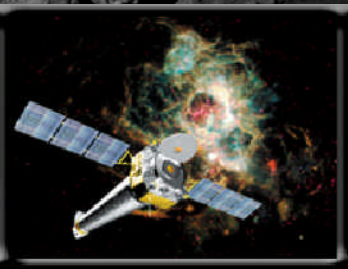
Technological advancement

Scientific discovery

Economic opportunity

National security




NASA supports America's leadership through space exploration.

Why the Moon

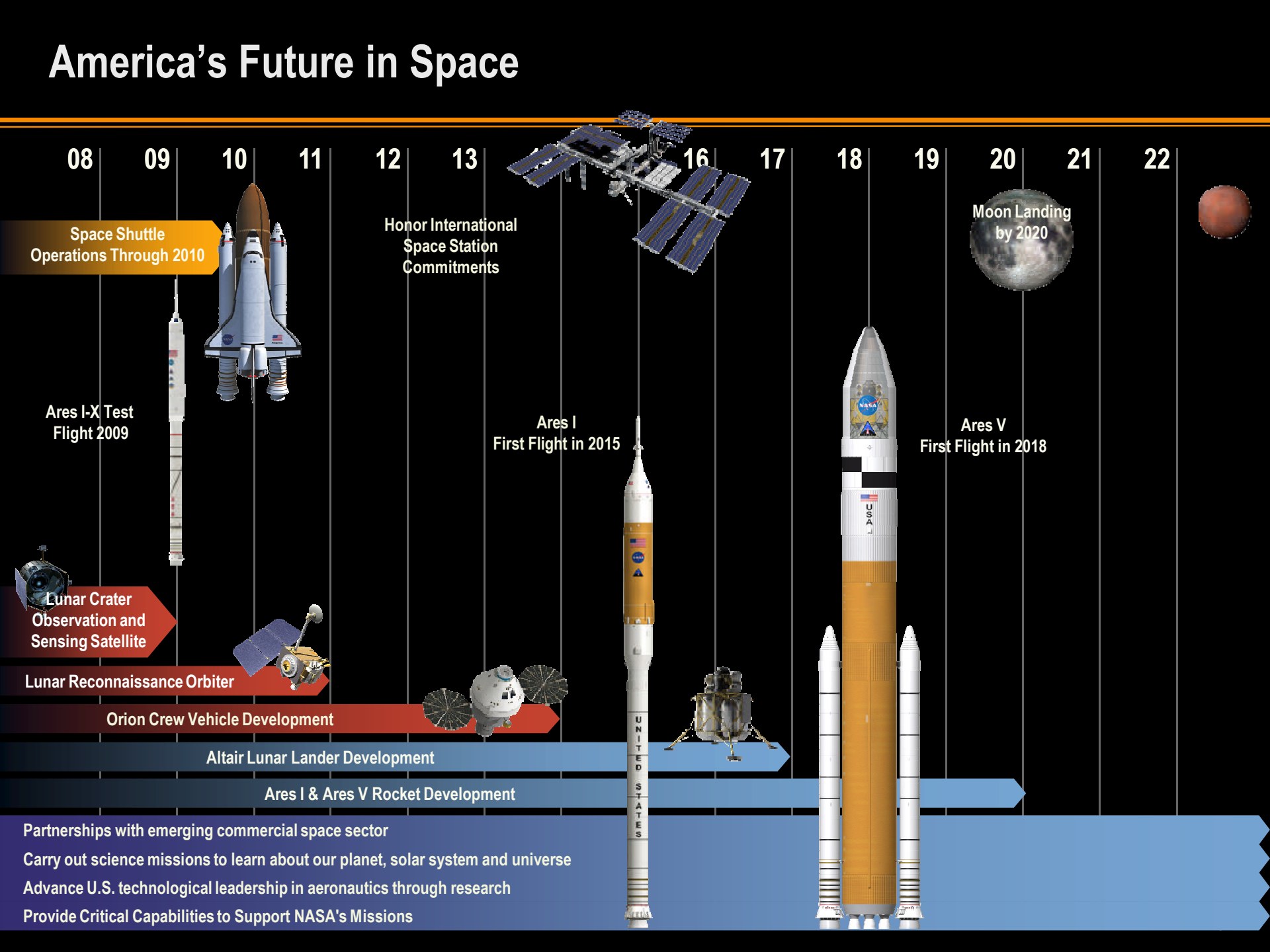
It's close
. . . three day journey

It's informative
. . . reveals planetary history

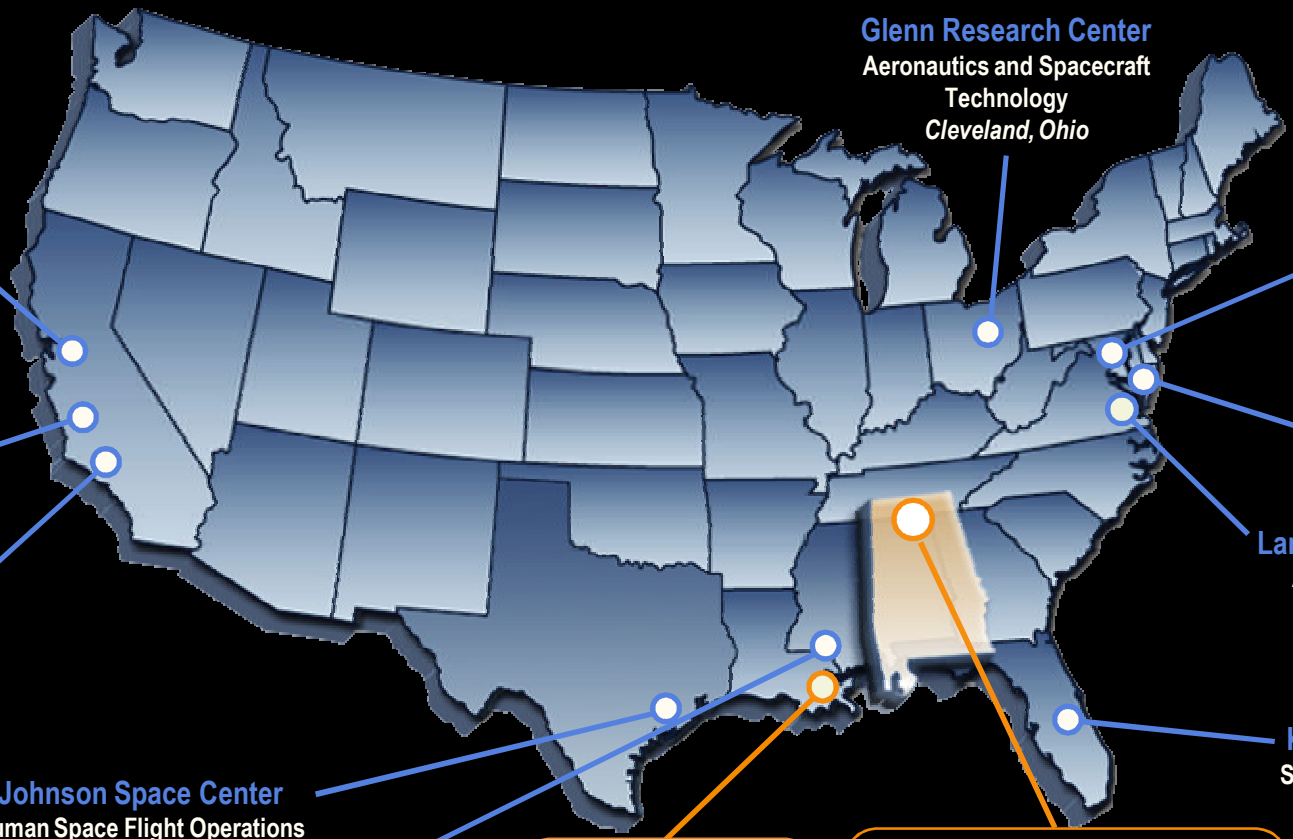
It's necessary
. . . stepping stone for future missions

Exploring the moon will benefit all of humankind.

America's Future in Space



NASA Around the Country



Glenn Research Center
Aeronautics and Spacecraft Technology
Cleveland, Ohio

Ames Research Center
Aerospace and Small Spacecraft
Moffett Field, Calif.

Goddard Space Flight Center
Science Missions & Telescopes
Greenbelt, Md.

Dryden Flight Research Center
Atmospheric Research & Testing
Palmdale, Calif.

NASA Headquarters
Washington, D.C.

Langley Research Center
Aviation & Space Research
Hampton, Va.

Jet Propulsion Laboratory
Deep Space Robotic Rovers & Networks
Pasadena, Calif.

Kennedy Space Center
Shuttle Launch and Landing
Cape Canaveral, Fla.

Johnson Space Center
Human Space Flight Operations
Houston, Texas

Michoud Assembly Facility
Shuttle & Constellation Manufacturing
New Orleans, La.

Marshall Space Flight Center
Space Transportation, Systems, and Science
Huntsville, Al.

Stennis Space Center
Shuttle Engine Testing
Bay St. Louis, Miss.

Marshall has a key role in NASA's mission.

Launching a Legacy

The uniting of science and space exploration began with the launch of Explorer I in 1958.

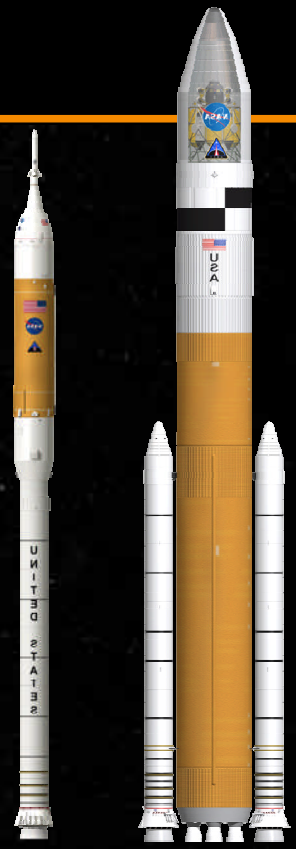
Marshall: uniting science and exploration.

Exceptional Past – Extraordinary Future

Major U.S. space achievements have roots at Marshall.

Knowledge and experience from our past will positively impact our future.

Marshall is setting the stage for a new era of science and exploration to begin.



Marshall is an important part of America's space exploration success.

Marshall's Continuing Role in Space Exploration

Marshall makes significant contributions to each primary focus area.

Lifting from Earth

Space shuttle – our current vehicle

Main engines, external tank,
solid rocket boosters

Transitioning to Orion for missions beyond
low Earth orbit

Best elements of shuttle technology
used to develop future vehicles

Ares rockets – our future vehicles

Successor to shuttle for routine space access

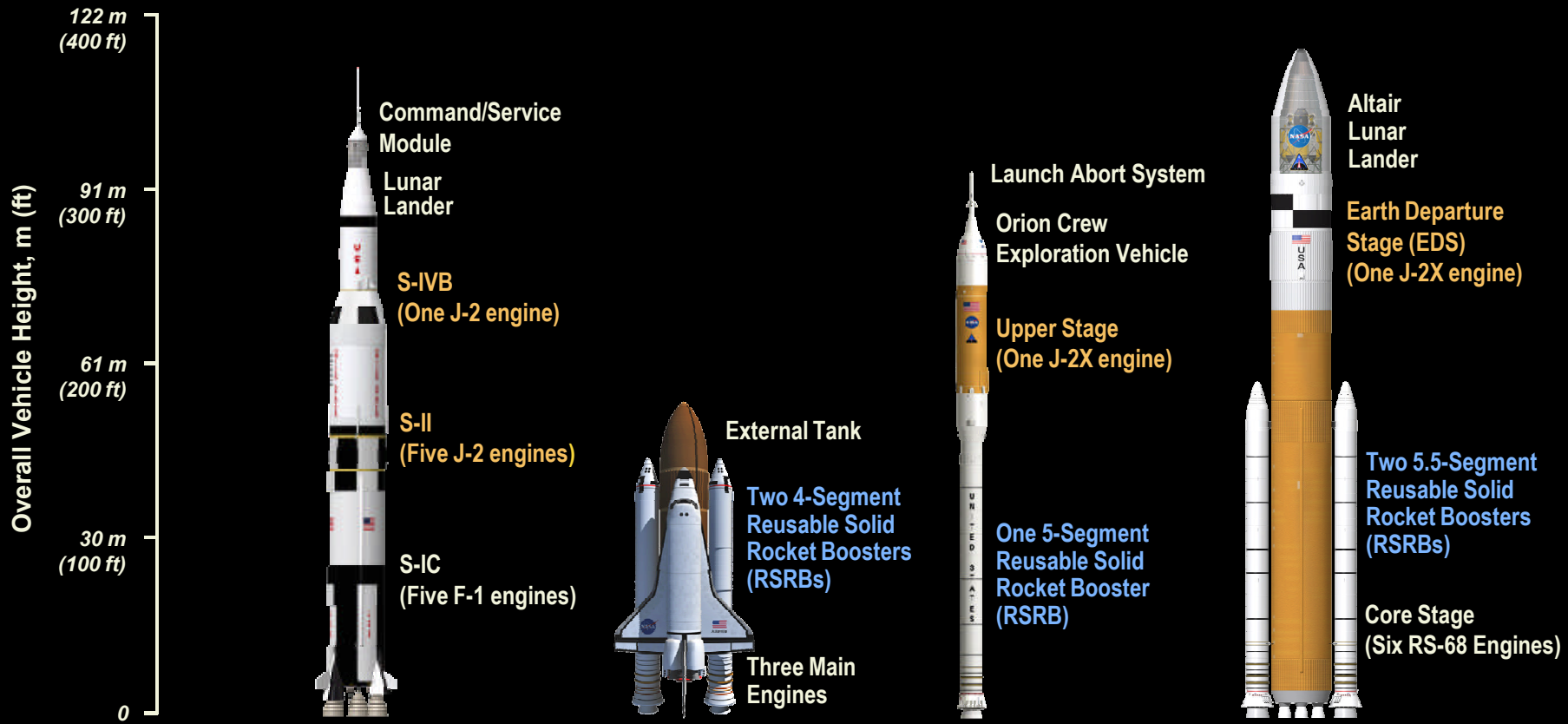
Part of NASA's Constellation Program

Marshall manages the development of
both the Ares I and the Ares V

First test flight is scheduled for 2009

Marshall builds rockets, from Saturn to Shuttle to Ares.

Building on 50 Years of Proven Experience



Saturn V	Space Shuttle	Ares I	Ares V
1967–1972	*1981–Present*	*First Flight 2015*	*First Flight 2018*
Height: 110.6 m (363 ft)	**Height:** 56.1 m (184.2 ft)	**Height:** 99.1 m (325 ft)	**Height:** 116.2 m (381.1 ft)
Payload Capability: 44.9 mT (99,000 lbs) to TLI 118.8 mT (262,000 lbs) to LEO	**Payload Capability:** 25.0 mT (55,000 lbs) to LEO	**Payload Capability:** 25.5 mT (56,200 lbs) to LEO	**Payload Capability:** 187.7 mT (413,800 lbs) to LEO 71.1 mT (156,700 lbs) to TLI with Ares I 62.8 mT (138,500 lbs) direct to TLI

mT – metric tons
TLI – Trans-Lunar Injection
LEO – Low Earth Orbit

Ares Rockets: Launching America's Future in Space

The Ares I will deliver crew and service to the International Space Station.

The Ares V will transport the Altair Lunar Lander and other heavy cargo.

Together, the Ares I and Ares V rockets will take crew and cargo to the moon.

The Ares rockets will launch America's future in space.

Living and Working in Space

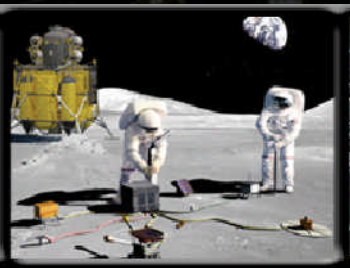
Supporting Life and Work

- Producing clean air and recycling water
- Providing around-the-clock science operations support
- Making science experimentation possible in space

Future Systems

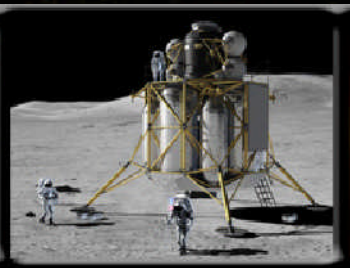
- Exploration life support systems
- Radiation hardened electronics
- Altair Lunar Lander systems
- Lunar resources utilization

Payload Operations Center



Lunar Resources

Environmental Control & Life Support



Altair Lunar Lander

Working in Space

Marshall supports crews living, working, and conducting science in space.

Understanding Our World

Environmental Monitoring

- Understanding climate change and weather patterns

Weather Prediction

- Improving forecasts and weather warning times

Hurricane Research

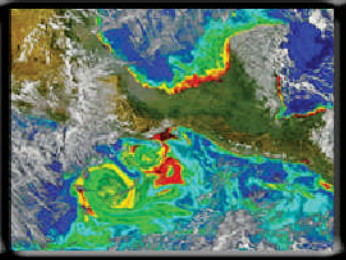
- Predicting the intensity and dynamics of storms

Global Hydrology & Climate Center

HIRAD

SPoRT

Environmental Monitoring



SERVIR

Marshall Earth Science improves our lives and our planet.

Understanding Worlds Beyond

Preparing for human return to the moon

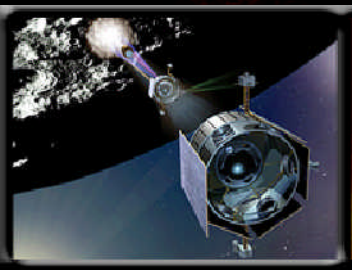
- Robotic missions to search for water ice and gather data
- Program office at Marshall

Learning about our solar system

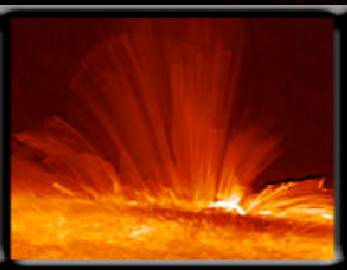
- Spacecraft to analyze the inner workings of the sun, planets, comets and asteroids
- Program management and instrument development

Learning about our universe

- Scientific instruments to reveal information about activity in deep space
- Management, design and construction

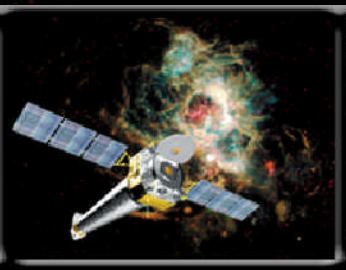


LCROSS



HINODE

Discovery/
New Frontiers

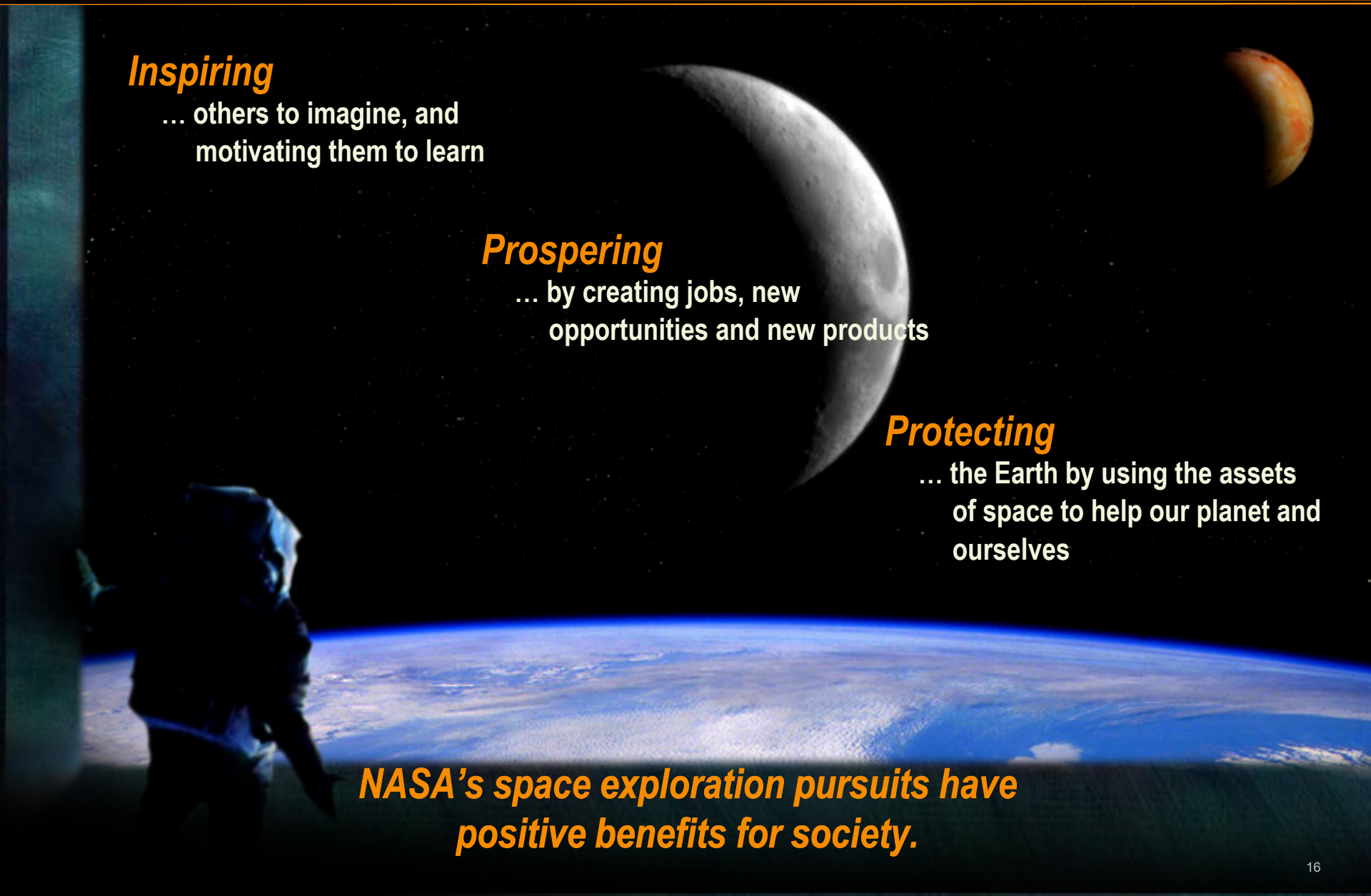


Chandra

JWST/
Marshall XRCF

Marshall Science uncovers mysteries about our moon, solar system, and universe.

Improving Lives Through Space Exploration



Inspiring

… others to imagine, and motivating them to learn

Prospering

… by creating jobs, new opportunities and new products

Protecting

… the Earth by using the assets of space to help our planet and ourselves

NASA's space exploration pursuits have positive benefits for society.

From Exploration to Innovation

From fueling rocket engines
to defusing land mines

From clean water
on the space station
to clean water
in remote areas

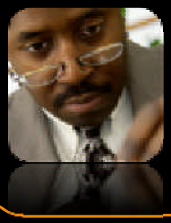
From space satellite imagery
to crime-solving imagery

Marshall's technology and innovation benefit life on Earth.

From Exploration to Opportunity

$2.6 billion
budget in fiscal year 2008

6th largest
employer in the Huntsville - Madison county area



> 7,600
employees at Marshall
(2,634 civil service employees in fiscal year 2008)

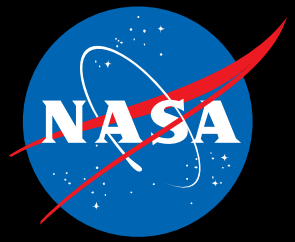
4.5 million
square feet of space occupied in Huntsville

$1 billion
impact to Alabama economy

2.2 million
square feet of manufacturing space at Michoud Assembly Facility in New Orleans

Marshall is an engine of opportunity for its community and beyond.

Launching the Future


NASA